

## CLAIMS

I claim:

1. A valve system lifter for use with a cam and a push rod in a combustion engine, the lifter comprising:
  - a lifter body comprising a first metal, the lifter body being adapted for connection to a push rod;
  - a face pad, comprising a second metal different from the first metal, attached to the lifter body for contacting a cam;
  - a connector material that attaches said face pad to the lifter body, the connector material comprising at least one metal that is different from said first metal and said second metal.
2. A valve system lifter as set forth in Claim 1, wherein the connector material comprises silver.
3. A valve system lifter as set forth in Claim 1, wherein the connector material comprises silver and copper.
4. A valve system lifter as set forth in Claim 1, wherein the connector comprises a copper alloy layer between two silver layers.
5. A valve system lifter as set forth in Claim 1, wherein the connector material comprises a copper, zinc, and cadmium center with outer layers of silver.
6. A valve system lifter as set forth in Claim 4, wherein the face pad comprises a metal carbide material.
7. A valve system lifter as set forth in Claim 5, wherein the face pad comprises a metal carbide material.

8. A valve system lifter as set forth in Claim 6, wherein the metal carbide material is comprises tungsten carbide.
9. A valve system lifter as set forth in Claim 6, wherein the metal carbide material comprises titanium carbide.
10. A valve system lifter as set forth in Claim 6, wherein the metal carbide material comprises tantalum carbide.
11. A valve system lifter as set forth in Claim 6, wherein the metal carbide material comprises niobium carbide.
12. A valve system lifter as set forth in Claim 7, wherein the metal carbide material is comprises tungsten carbide.
13. A valve system lifter as set forth in Claim 7, wherein the metal carbide material comprises titanium carbide.
14. A valve system lifter as set forth in Claim 7, wherein the metal carbide material comprises tantalum carbide.
15. A valve system lifter as set forth in Claim 7, wherein the metal carbide material comprises niobium carbide.
16. A valve system lifter for use with a cam in a combustion engine, the lifter comprising:  
a lifter body;  
a face pad for contacting a cam;  
a connector material between the body and the face pad, the connector material comprising three layers, which are first and second layers comprising silver, and a third layer comprising copper between said first and second layers.

17. A valve system lifter as in Claim 16, wherein the face pad is a disc 75 - 150 thousandths of an inches thick, the connector material is 10 - 20 thousandths of an inch thick.
18. A valve system lifter as in Claim 16, wherein the body comprises cast iron.
19. A valve system lifter as in Claim 16, wherein the body comprises steel.
20. A valve system lifter as in Claim 16, wherein the face pad comprises tungsten carbide.
21. A valve system lifter as in Claim 16, wherein each of the layers comprising silver are 2 - 8 thousandths of an inch thick, and the layer comprising copper is about 10 - 14 thousandths of an inch thick.
22. A valve system lifter for use with a cam in a combustion engine, the lifter comprising:  
a body comprising a ferrous alloy;  
a face pad for contacting a cam, the face pad comprising tungsten carbide; and  
a connector between the body and the face pad, the connector comprising silver.
23. A valve system lifter as set forth in Claim 22, wherein said connector comprises silver, copper, cadmium, zinc and nickel.
24. A valve system lifter as set forth in Claim 23, wherein said connector includes three layers, which are a central layer of a mixture of said copper, cadmium, zinc and nickel, and two outer layers on opposing sides of the central layer comprising silver.
25. A method of making a combustion engine lifter, the method comprising:  
providing a connector wafer comprising silver;  
providing a lifter body of a first metal;  
providing a lifter face pad of a second metal different from said first metal;  
providing a connector wafer comprising silver in between said lifter body and said face pad; and

induction welding said connector wafer between the lifter body and the lifter face pad, wherein said silver liquefies and bond the face pad to the body.

26. A method as in Claim 25, wherein said connector wafer comprises silver and at least one metal different from said first metal and said second metal.
27. A method as in Claim 25, comprising rounding the face pad to have a radiused outer edge.
28. A method as in Claim 25, comprising grinding the face pad to have a radius in the range of 55 - 70 inches.